

Message

From: Surratt, Jason D. [surratt@unc.edu]
Sent: 10/9/2018 3:32:28 PM
To: Zhang, Zhenfa [zhenfaz@email.unc.edu]
CC: Strynar, Mark [Strynar.Mark@epa.gov]; Gold, Avram [golda@email.unc.edu]; Riedel, Theran [Riedel.Theran@epa.gov]
Subject: Re: synthesis help

Thank you Zhenfa for replying so quickly! Mark, I'll likely arrive to EPA about 30-45 minutes before my talk. It would probably be best to meet with you sometime after. I've copied Theran Riedel here who invited me over to give the air pollution seminar. I'm not sure if he is organizing meetings for me.

Thanks again, Jason

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On Oct 9, 2018, at 11:12 AM, Zhang, Zhenfa <zhenfaz@email.unc.edu> wrote:

Hi Mark,

What I meant is that even the starting chemical might take a while for them to make it, that is why I am also looking into making the starting chemical itself too. I called the vendor you mentioned about the starting material and they will get back to me regarding the leading time but I suspect it is not going to be very quick. I also called a couple of other vendors. Anyway, depending on the availability of what you called the starting chemical (acyl fluoride and sulfonyl fluoride) or other even more basic material that we can start with, we will go from there.

Zhenfa

From: Strynar, Mark <Strynar.Mark@epa.gov>
Sent: Tuesday, October 09, 2018 10:24 AM
To: Zhang, Zhenfa <zhenfaz@email.unc.edu>; Surratt, Jason D. <surratt@unc.edu>
Cc: Gold, Avram <golda@email.unc.edu>
Subject: RE: synthesis help

Zhenfa,

I know that Synquest Labs could make it if I asked them. However the cost is often quite large and takes very long for them to make it. I was hoping we could purchase the starting chemical (acyl fluoride and sulfonyl fluoride) and we could

work with you to synthesize and purify the chemical we need. I am fairly sure the PFAST network could use this analyte as well. It is one of the analytes that is not currently commercially available.

Mark

From: Zhang, Zhenfa [mailto:zhenfaz@email.unc.edu]
Sent: Tuesday, October 09, 2018 9:13 AM
To: Surratt, Jason D. <surratt@unc.edu>; Strynar, Mark <Strynar.Mark@epa.gov>
Cc: Gold, Avram <golda@email.unc.edu>
Subject: Re: synthesis help

Hi Mark,

This is Zhenfa Zhang, your talk was great to hear at the symposium.

Regarding the standard, it seems we should be able to make it even though I have no experience with fluorine chemistry. I agree with your thought about the starting material, it seems we can do the decarbonylation on acyl fluoride followed with acid treatment to achieve the transformation of the acylfluoride to H. In the same time we can watch how the sulfonyl fluoride behave during that transformation. I don't know if it would be hydrolyzed or stay intact. Either way is fine, we can go further hydrolysis if it stays intact, watching out for elimination though.

I already inquired the vendor you mentioned for the starting material, I assume it is a small customer synthesis company and there is a leading time for them to make it upon request. In the mean time I am also looking to go from more basic material to make the starting material itself. We can start from wherever we can get it done sooner and practical.

Zhenfa

From: Surratt, Jason D.
Sent: Monday, October 8, 2018 4:42:23 PM
To: Strynar, Mark
Cc: Zhang, Zhenfa; Gold, Avram
Subject: Re: synthesis help

Dear Mark,

Thanks for your email and I apologize for my slow reply. I was really swamped last week with things non-related to PFAS.

I've forwarded your email to my close colleagues Professors Zhenfa Zhang and Avram Gold. They are also copied here. I tend to fund Zhenfa Zhang to work with my lab to help us with our ongoing synthesis needs. He is very talented. They will likely respond to you very soon. I know they are reviewing your email carefully first and get back to you with their thoughts on feasibility and any specific questions.

Just as a heads up, it seems like I'll be presenting a seminar on Oct 31 at 10 AM to the Air group at EPA. Dr. Theran Riedel (my former Post Doc) appears to be organizing it. Maybe I can stop by to see your lab that day? We can keep it brief.

Also, Wanda and I may be contacting you very soon. I think we would like to see what PFAS standards you might have that we can use and share with other PFAST Network researchers.

Most sincerely, Jason

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On Oct 2, 2018, at 8:07 AM, Strynar, Mark <Strynar.Mark@epa.gov> wrote:

Hi Jason,

I hope you have got some time to rest since the meeting on Friday. I thought it was well done and covered a lot of important ground.

I am emailing to start the discussion of our need to get some standards synthesized and follow-up on isolation of chemicals from industrial products. Setting up a visit to your labs for a crew of us would be great too.

My most pressing need is the synthesis of a chemical we find in the water in Wilmington and in the serum of humans exposed. We call it Nafion BP2. It is the second chemical below. We have received a small amount of this chemical from Chemours (~80 mg) about 1 year ago. We are now conducting experiments on dosed rodents that require a lot of chemical so our stock is all but used up.

I know we can get this chemical from a commercial vendor. It is \$395 for 5 grams.

<http://synquestlabs.com/product/id/52754.html>

<image001.jpg>

We need Nafion BP2 (here below)

<image002.png>

As you can see this requires the removal of the acyl fluoride and replacement with a H. In addition the sulfonyl fluoride needs to be turned into a sulfonate. I believe if this was simply put in water the acyl fluoride and sulfonyl fluoride go to the corresponding carboxylic acid and sulfonate. I also know for other PFAS the decarboxylation can occur via thermal or chemical attack.

I welcome your response. We have hands in the lab to help out or conduct this synthesis. What we lack is knowledge of how and the equipment to perform this experiment. Please do get back to us when you have a chance.

Thanks,
Mark

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